THE
VETERINARY JOURNAL

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JANUARY, 1928.

Presentation of THE LAVERAN GOLD MEDAL
to SIR ARNOLD THEILER, K.C.M.G., Hon. Assoc. R.C.V.S.

FEW scientists have done more to add lustre to the veterinary profession of any country than Sir Arnold Theiler, and although his ostensible retirement from active participation as a Government official in the elucidation of the disease problems of animal epidemics is supposed to have taken place, there is every evidence that his ideas of " rest " are not compatible with idleness and inactivity ; and that the British veterinary profession will still be able to avail itself of his mature judgment wherever suitable occasions demand them.

His latest honour has been to be selected as the recipient of the great honour of the Laveran Gold Medal from the Pasteur Institute in Paris ; and the honour to our colleague is all the greater because it is the first time that this medal has been presented.

The ceremony took place in Paris in the Assembly Hall of the Institut Pasteur on the 14th of December, Sir Arnold Theiler being received by the Director, Professor Roux, who welcomed him most cordially and made many complimentary remarks upon the good work which he had done.

Professor Mesnil, the President of the " Société de la Pathologie Exotique " also spoke at length of the successful work which Sir Arnold had accomplished in South Africa, especially in regard to certain blood diseases and trypanosomiosis.

Professor Mesnil's speech was followed by one from Professor Leclainche, the Director-General of Veterinary Services in France, and he too emphasised the practical application made by Sir Arnold Theiler of the scientific facts which he had discovered.

In the evening Sir Arnold was the guest of the " Acadamie des Sciences Coloniales," whose president is the Minister of the Colonies.

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M. Domergue, the President of the French Republic, was also there, and Sir Arnold had the honour of being presented.

The Laveran Medal is only one of many honours awarded to our learned colleague, whose original veterinary qualification was that of the University of Berne; and it is worthy of note that (as with the Laveran award) the first medal and grant awarded by the British Association for the Advancement of Science in South Africa was made to Sir Arnold Theiler; so that, even before he had been singled out for this further honour, apart from his actual great work, we of the British veterinary profession have had much cause to be proud of our South African *confrère*. The Honorary Associateship of the Royal College of Veterinary Surgeons is the tie which binds him to us, and upon which we of the rank and file of the British veterinary profession can claim his kinship. That we are proud of this bond of fellowship and wish him the best of all he may desire for himself, is well illustrated by the cordial and great enthusiasm with which his name is greeted wherever his appearance is noticed at a veterinary gathering. The regret is that we do not see as much of him as we would wish.

ROYAL SOCIETY for PREVENTION of CRUELTY to ANIMALS *v.* THE VETERINARY DEPARTMENT of THE MINISTRY OF AGRICULTURE.

In a case held before the Swindon bench of Magistrates on the 3rd inst., the R.S.P.C.A. brought allegations of cruelty against Mr. Arthur Berry, F.R.C.V.S. (Superintending Inspector of the Ministry of Agriculture) and Mr. Albert Victor Franklin, M.R.C.V.S. (Permanent Inspector), asserting that a number of dairy cows which had to be slaughtered for Foot and Mouth Disease were "dragged" to the place of slaughter behind a cart and then destroyed with the humane killer in view of the dead bodies of their fellows.

The prosecution relied mainly on the evidence of two witnesses, one of whom was 400 and the other 700 yards away at the time; their statements being directly controverted by a number of witnesses (including the Deputy Chief Constable of Wiltshire, an Inspector of Constabulary, and a Police Officer) who were actually in the field when the killing took place.

The allegations of cruelty were so obviously unsupportable that the learned magistrates stopped the proceedings and unanimously gave a verdict in favour of the Ministry officials. The verdict was received in the Court by the applause of the audience.

General Articles

THE LAHORE VETERINARY COLLEGE. AN APPRECIATION.

By SIR MICHAEL FRANCIS O'DWYER, G.C.I.E., K.C.S.I.,
Late Governor of the Punjab (1913-1917).

It is fitting that Col. Walker's admirable article on the "Lahore Veterinary College," for which he has done so much, should find a place in THE VETERINARY JOURNAL*; for there is no Veterinary Institution in India, or for that matter, anywhere in the East, which has such a splendid record of achievement.

The Civil Veterinary Department was not established in India till 1891; but the Lahore Veterinary School, which was the nucleus of the present admirably equipped College, had been started as far back as 1882.

I have followed its progress from its humble beginnings, when I went to Lahore as a young civilian in 1885, down to its full maturity, when I left the Punjab in 1919; and am happy to think that, as Lieutenant Governor of the Province, I was able to assist its steady development and the rapid extension of its scope of usefulness.

When I went to the Punjab there were not more than half a dozen veterinary hospitals and dispensaries, for the treatment of the 16 million horses and cattle in that great agricultural province with a population of 20 millions. There are now nearly 200, and these are in charge of the assistants and graduates trained in the Lahore College.

The whole outlook of the people towards veterinary science has been altered, and there is probably no more popular official in the countryside than the British or Indian veterinary superintendent and the Indian veterinary assistant. The Viceroy of India, Lord Irwin, paid a special visit to the College in October last, and in writing to me, mentioned what an excellent institution it was, and how well equipped and maintained.

The wonderful success of the College is in my opinion due to the following facts:—

(1) From the start it was fortunate in having a most capable and devoted European staff—Kettlewate, Nunn, Gunn, Peace, Farmer, Blenkinsop, Sullivan, Walker—to mention only a few of the most prominent, who were able to inspire the Indian staff and students with their own enthusiasm.

* Colonel Walker's admirable article on the Lahore Veterinary College appeared in THE VETERINARY JOURNAL for July of last year.

(2) They were able to secure as Indian assistants and professors men of good family and social status, such as Vaiyids Amir Shah, Mahlat Vhah and Sirdar Shah, who were in close touch with the leading agriculturalists of the province.

(3) The relations between the staff and the students have always been most close and cordial. As a result, throughout all the disturbed period of the war and after, when many of the Lahore Colleges were infected by outside agitation and the students in many cases went on strike, the students of the Lahore Veterinary College remained steady and loyal. The College was proud of the great work done by its *alumni* in all the Eastern theatres of war, and showed that it was determined to maintain that high reputation. Long may it continue its admirable work.

THE HORSE OF ANTIQUITY.

By R. W. M. METTAM, M.Sc., M.R.C.V.S.,

Formerly Professor of Veterinary Anatomy, Transvaal University College, Pretoria, South Africa.

Introduction.

THERE is no better practical evidence of the theory of evolution than the history of the horse during its various phases of development from its most primitive type to the origin of the wild horse, the ancestor of the animal in the world to-day.

It is not intended in this article to deal with the Palæolithic animal, but with the horse of early historic times, starting at the period when the world was stocked with various varieties of the wild horse, at a time when man had already appeared but was still very primitive.

The modern idea is that the horse was evolved in North America, and that from time to time large migrations spread over the world when suitable land bridges afforded. At the time of the appearance of the last ice-wave, both the New and Old Worlds were stocked by, at least, three varietie sof wild horses.

Although the Ice Age was instrumental in totally exterminating the wild horse in America, and greatly reducing the number of animals in Europe, yet, fortunately, sufficient numbers survived in Asia and Africa to re-populate the Old World.

It is very remarkable that the horse so completely disappeared in America, the land of its evolution, and even in Europe in Neolithic times the animal was by no means common.

Lull and Osborn believe that the equine race was largely exterminated by some epidemic, e.g. trypanosomiasis, but this by itself

appears to be insufficient reason why a whole continent should be made uninhabitable—though only temporary as we shall see later—for equine life. We, in Africa, are only too well aware of the presence in this continent of the most fatal epidemic known to-day, and yet the whole of Africa is not rendered horseless, though large tracts of magnificent country are, and even in these parts animals survive in considerable numbers as they possess a fairly secure immunity. It is far more likely that more than one influence was at work such as (*a*) complete change of climate caused by the ice invasion, which led to an alteration of flora, the nature of the country and probably the local insect fauna ; (*b*) the presence of some devastating epidemic of a greater virulence than any known existing equine disease ; (*c*) overcrowding ; (*d*) interference with breeding, and (*e*) slaughtering of animals on a large scale both by wild carnivora and by primitive man.

That the environment of certain parts of the world was not rendered permanently unsuitable by the Ice Age for equine life is shown by the rapidity with which horses bred when introduced into North and South America by the Spanish during the wars of conquest early in the 16th century.

When the first great civilisation of man appeared, the world with the exception of America and Australasia was populated by at least three types of wild horse, which according to W. C. Ewart, were :—

1. Steppe horse, which had a large head, short back and heavy limbs. It inhabited steppe and savannah regions, and is to-day represented by the Mongolian wild horse or Przevalski's horse. This animal is found in the Gobi desert of Central Asia and Mongolia. It is a small animal yellow dun in colour, with black mane, tail and legs and a white muzzle. It has no forelock, but has a distinct grey beard beneath its large head.

2. Forest horse, which was found in forest and marshy regions. It was a large clumsy animal with short limbs, but very strong feet. This is the animal which inhabited Western Europe, whose remains have been found in Solutrè in such vast numbers.

3. Desert horse, which inhabited dry arid regions. It was a small animal with long slender legs and a narrow fine head—the forefather of the famous Arab of later days.

Those three types were present in large numbers in Asia whence frequent migrations repopulated Europe, which was depopulated by the last ice-wave, though in many parts of Neolithic Europe and especially in England the horse remained rare until a later date. In the forests of Central Europe and in France the forest horse was evidently very abundant, for skeletons of about 80,000 have been

unearthed near an ancient open-air encampment at Solutrè in France. Those skeletons are of the forest horse and nearly all are middle-aged animals, which disproves the theory held by many that these animals were domesticated. Near this vast cemetery mural drawings by primitive man show the type of animal, but what is especially interesting is that these animals are shown as being " haltered," i.e. that harness of a crude type has been successfully adjusted on the animal's head. Although this haltering of the Solutrè horse has led many to believe that this animal was domesticated by the men of Solutrè, there is no definite evidence of domestication. It is now generally agreed that these horses were so docile and so easily caught that primitive man was able to catch his animal and slaughter him at some particular spot—hence the immense horse grave. Such a wholesale slaughter of animals might easily be the cause of their complete disappearance from parts of the world at one time or another, especially if there were other simultaneous devastating causes, such as a serious and highly fatal epidemic of some kind.

In considering the immense " horse grave " at Solutrè, it must be remembered that many big-game hunters believe that certain species of wild game, when about to die either from natural causes or from wounds inflicted by man or some animal, wander to some site known to themselves and die there. Many hunters and natives believe this to be true of the African elephant. This statement is by no means unanimously accepted in Central Africa, but it is worthy of thought in connection with the Solutrè cemetery.

The skeletons of the forest of Solutrè show that the animals were considerably inferior in size to the average horse of to-day, which we know has only increased in size as a result of domestication and the breeding out of characters necessary for the various uses and needs of civilised man.

Before concluding these introductory remarks, I would like to make it clear that in Palæolithic times we have no evidence of the domestication of the horse, despite the mural drawings of Solutrè. The animal at this time was probably the principal food of man, who did not hesitate to slaughter heavily to supply his wants. It also appears that although the animal was hunted for his flesh that he must have been fairly docile, for no horse of to-day unless tamed or properly broken, would allow himself to be secured by what must have been a clumsy head-piece.

The Horse of Babylon, Egypt and Arabia.

The horse is first mentioned in history during the Kassite invasion of Babylon. Although the invaders were defeated, the Babylonians

were greatly impressed by their mobility during retreat, and soon afterwards the horse was introduced into Babylon and Mesopotamia, and universally bred for hunting and war.

The name given to the strange animal by the Babylonians was "The Ass of the East," which seems to indicate that the animal was introduced from Northern or Central Asia, while to a certain extent it also gives us the impression that at this time the horse was ass-like in appearance.

The Kassites, who came from Elam, were a wandering nomadic tribe, which found the country between India and the Persian Gulf suitable for horse rearing. It is interesting to note that at the present time this part of Asia is sparsely inhabited, and no famous breed of horse is reared.

Soon after its appearance in Babylon the horse was adopted as a divine symbol, as he already was amongst the Kassites, who were retained and employed by their conquerors to breed and manage the horse.

The first pictorial record of the horse is shown on a tablet of the time of Hammurabi. It is usually depicted both on tablets and architectural structures as possessing a huge pair of wings, attached to the body in the region of the shoulders, signifying divine origin.

Although it was present in Mesopotamia in large numbers, the horse was unknown to the Egyptian troops occupying Arabia, for there is no mention of the animal being present in the Nile Valley before the 18th dynasty, or nearly 700 years after its first appearance in Babylon. Even then the horse was not introduced into Egypt by the Egyptians, but by the Hykos or Shepherd Kings, a wandering pastoral race who overran Egypt and held power for a considerable time. These nomadic people came from Central Asia and Arabia, and besides introducing the horse they also brought the chariot, which was soon adopted by the Egyptians for war and the chase. It is apparent that the horse bred well in the fertile valley of the Nile, and that Thebes rose to be the main site of horse breeding in Egypt, so that in a short time the army was equipped with light chariots and cavalry. Everyone knows that the Israelites flying from Pharaoh were pursued across the desert by the Egyptians with many chariots and horsemen.

The horse was used exclusively for war and hunting, and no mention is made of it being used for agricultural purposes, and peculiarly enough it was never deified, as were some of the other domestic animals.

Many people believe that Arabia was the real home of the horse, but they have little evidence of any kind to support their view, beyond

the fact that both in ancient and modern times the Arabian horse has been very famous and very much sought after. Historical evidence is very emphatic in deciding against the claims of this country, because as Huxley pointed out, if the horse was a product of Arabia, then it ought to have been known to the Israelites, who lived for a long time in Arabia and yet derived their knowledge from the Egyptians, and to Egypt where it was unknown before the 18th dynasty.

It is very likely that this country was populated by animals from Persia and Mesopotamia, for there always has been a close relationship between the Arab and Persian.

The Arabian horse has for so long been world famous, and throughout its history has done very much to improve the horse of all countries; its excellence being probably due to at least two reasons, viz. :—

1. The dry arid desert nature of Arabia, which demanded the essentials of speed and endurance to enable the animal to cover the sandy desert between oasis and oasis ; and,

2. The character of the Arab himself, who relies on a fast horse full of stamina to assist him in attacking, plundering, and escaping from enemies in the desert. The long career of the maraudering desert Arab is due to the great care he has taken in breeding and managing his horse, for to-day the Arab horse is the fastest animal in the desert, just as he was in the days of Mahomet.

The Horse of Ancient Greece.

There is no doubt that the Ancient Greeks were far in advance of all contemporary nations in the art of breeding and managing horses.

It is not quite definitely known where the Greeks in the first instance learned about the possibilities of the horse, but it is most likely that they mainly derived their knowledge from Ancient Egypt.

From the very commencement of their history they recognised the great value of the horse, perhaps not so much as other nations in the use of the horse in war, but they excelled in the production of an animal for sport and the arena, creating the most famous horse of antiquity, which in recent years has only been surpassed in value by the British thoroughbred.

Everything was favourable in Early Greece for the production of a good type of horse, viz., climate, country, and the temperament of the people, while in early days the crossing of the indigenous animal with imported blood from Egypt and Persia gave very good results.

We know more about the Grecian horse, its life history and treatment, than about any other horse of antiquity, for we have written

accounts—often in great detail—handed down in the works of Homer, Hesiod, Xenophon, and others.

From them we learn that the horse was mainly used for hunting and for sports in the hippodrome, to a less extent in war, while apparently not at all for agriculture.

Very early in the history of Greece we have mention of the use of the horse in the Trojan War, not as cavalry, but to draw light chariots, to which they were somewhat insecurely attached. At this time only chiefs used chariots, which were very useful in conveying them from one part of the battlefield to another as the situation demanded. Although riding was still uncommon, yet it was not unknown, for Homer tells us how two famous Greek warriors rode some horses they captured during a night raid on the Trojan camp.

Shortly after the return of the Greek warriors riding was more extensively practised, and it is evident that Thessaly gave the rest of Greece the lead, because in that province the unusual sight of a mounted man gave rise to the fable of the Centaurs a half-horse, half human tribe which was said to inhabit the unknown regions of Northern Thessaly and Macedonia.

Soon after the adoption of riding the first horse-drawn carriage appeared. It is said that a crippled sportsman was the inventor of the vehicle, and he regarded it as a worthy substitute for riding, especially for those who were physically unable to enjoy the pleasures of horse-back exercise.

One of the greatest incidents in the history of the horse was the institution of racing in B.C. 680 at the 23rd Olympiad, while a few years later chariot racing began, which soon became the dominant pastime of the Greeks. Large well-made race courses were laid out, and various kinds and classes of races were frequently held.

Those races were very important and had a far-reaching effect on the history of the country. Good horses were in great demand, and the rivalry of the hippodrome produced one of the most famous horses of all times, while Greece became the horse breeding nation of antiquity.

The excellence of the Greek horse is praised in Homer and Tacitus, while at a later date Xenophon gives a detailed account of the management and breeding of horses, which was closely followed by the Romans some centuries later.

It is remarkable that though such excellent horses were produced for pleasure, the Greeks neglected the use of mounted troops, though they were constantly opposed in battle by the famous cavalry of Persia. Probably the general use of the horse in battle was prevented by the rough broken nature of the country, which was unsuitable for

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cavalry manœuvres. The battle of Marathon—one of the 15 decisive battles of the world—was won by the Greeks without cavalry. At the beginning of the Peloponnesian War in B.C. 431 the Greeks had only 1,200 cavalry, but from this time the numbers steadily increased, showing that the Greeks were recognising the use of this important branch of the army. Both Philip of Macedon and Alexander the Great were very skilful in the use of mounted troops which were more than the match of the Persian cavalry in the battles of Issus and Arbella.

Long after the decline of Greece, when the Roman Empire was already formed, this country continued to produce the finest horses in the world, and they had a great market in Rome, where no expense was spared to obtain the best horses for their " circus publicus."

The finest description of the horse of antiquity is given by Xenophon, who goes into with great detail the whole question of breeding. Some of his views are remarkably sound and still hold good to-day, though, of course, there are many that have not stood the test of time. Xenophon is the first to describe certain animal diseases, especially of the foot, for which he advocates treatment, which is not much inferior to what is done to-day, it being based on common sense and very simple remedies. Because of his knowledge of the horse in health and disease, Xenophon has been rightly called the " father of Veterinary Science."

The Horse of Ancient Rome and the Dark Ages.

Unlike the Greeks the Romans were not an equestrian nation, and throughout their long history depended on foreign breeds both to equip their army and for sporting purposes in the " circus publicus."

The Romans were somewhat unfortunate in having a particular low type of indigenous animal, which apparently did not cross satisfactorily with the best imported blood, no matter whether it came from Spain, Africa, Greece, or Persia. As a result of early bad luck, the Romans became and remained apathetic as regards breeding, and entirely relied on foreign animals to supply all their wants.

Even their cavalry was nearly all foreign, and after 140 B.C. it became totally foreign, patrician officers being put in command of horsemen drawn from all over the Empire.

This disbandment of home cavalry was carried out at the conclusion of the Punic Wars, during which Hannibal's native Spanish and African horsemen mounted on very good native horses, repeatedly annihilated the Romans mounted on the weedy indigenous animals of Etruria.

This local animal, however, proved to be a good general utility

beast, and was extensively used in the postal and baggage services, and also for conveyance of citizens, either on horseback or in a light vehicle, throughout the Empire. This traffic was greatly facilitated by many excellent roads, for which the Romans were so famous, and at the time of Cæsar and Cicero there was a very well-organised horse transport, which permitted of fairly rapid travelling. Cicero mentions how a messenger carrying important dispatches covered 40 miles in 6 hours, which even to-day is fast travelling on horseback.

The Romans learned from the Greeks the use of the horse for sport, but it is quite evident from information at our disposal that this sport was not prompted by the love of equestrian amusement, but rather from more sordid reasons in that all that was base in the national character was allowed to spend itself in trickery and vice, and even crime of the worst kind. The emperors themselves did not hesitate to employ foul means to rid themselves of a dangerous rival, while death from poison was the common fate of a champion in the "circus publicus."

From recent discoveries in Pompeii it appears that horse races were conducted in a manner similar to the procedure of the race meetings of to-day. Meetings were advertised by means of placards placed in prominent places, and cards showing the names of riders, drivers, etc., were sold, while gambling took place on a large scale, large fortunes being lost or won in a manner similar to what is said to occur at the famous races in Britain at the present time.

At first, in the early days, the riders and drivers were either hired men or slaves, while the Roman citizens were content to be spectators, but during the Empire the patricians, and even the emperors, took part in the sports of the arena, with the result that great rivalry existed between various families and factions in order to win.

In Rome itself a regular cab service was instituted, which facilitated movement throughout the town. Although the Greeks invented the horse-carriage, yet the Romans were the first to form a regular cab service for the convenience of the general public. As in most large towns of the present time these cabs were drawn up in a single row on special stands or ranks convenient for the general public. These cabs were two-wheeled conveyances seating two people side by side with the driver. Usually they were drawn by one or two horses *or* mules.

No mention is made in Latin literature of the use of the horse in agriculture, though there were many references to the use of the mule in ploughing, and to the various duties of the ox on the farm.

Virgil never mentions the farm-horse, though he writes very appreciatingly of the war-horse.

It is fairly safe to conclude that the absence of mention of the farm-horse means that the horse was not used for agricultural purposes in Roman times.

It is not until the third century A.D. that a Roman author appears who deals in any detail with the art of horse breeding, but then it is only too apparent how considerably he follows the teaching of Xenophon and other Grecian authorities. This author—Vegetius by name—hands down to us good pictures of the horses of his time, though his views on certain equine diseases show little or no advance on those of Xenophon.

With the decline of the Roman Empire history entered a long period of dark and comparatively unknown ages, during which the horse played a quiet but not insignificant part for it was at some date between A.D. 500 and the Norman conquest of England that the horse was first used on the land.

The appearance of the farm-horse was really an event of the greatest interest and importance in the history of the world, as it indicated a distinct advance on the older and more ancient methods of using cattle and other prehistoric devices on the land. It is only in our own times that agricultural methods have been further advanced by the introduction of motor tractors and other mechanical devices, but even now it is doubted by many whether the horse has entirely lost its usefulness in the sphere in which he has for many centuries played such a conspicuous part.

The appearance of the farm-horse necessarily lead to the breeding of certain essential qualities such as strength and stamina in place of speed and high spiritedness of the charger.

Indeed, even in the so-called " age of chivalry," the heavier type of horse came greatly into demand in the various armies as the knights were clad in steel armour of great weight, and could only be carried by very powerful horses. The accounts we are given of the horses of the crusaders and knights of the time of Richard Cœur de Lion and Ivanhoe make us visualise an animal of the heavy draught type so common and so useful in the British Army during the Great War.

Conclusions.

Mankind owes a deep debt of gratitude to the horse, first in savage days as an easily obtained food, later on as a partner in his labours, without whose aid human progress towards a high civilization would have been immeasurably retarded (Lull). It has been considered by some that the condition of semi-barbarism of many North American Indians, races of great potentiality, was in part due to the premature extinction of the American horse.

In the civilizations of Peru and Mexico the lack of the horse was very apparent, and a serious obstacle to the attainment of the great heights reached by the ancient civilizations of Greece, Babylon, Rome, etc. In both Peru and Mexico substitute animals were used, very satisfactory as beasts of burden, but quite useless for sport or war.

It would be very interesting to find out who were the first to use the horse, but in the absence of any archæological evidence, we have either to leave the early days of the domestic horse in the dark ages or rely on conjecture. It is quite easy to imagine how primitive man played with his new toy, for there is no doubt that the greatest difficulty was overcome when the horse was first successfully haltered and handled. Having reached the stage when the horse was broken in, it was only a short step further for man to try and take advantage of the speed and endurance of the animal, and use them for his own benefit and requirements. It is quite likely that the horse was both ridden and driven by unknown barbarian tribes long before the appearance of the Kassites or before the foundation of Babylon, for the animal was obviously first appreciated and used by wild nomadic tribes who found it of inestimable service, and it is quite feasible that these hardy primitive men mounted the horse long before historic times, while chasing and breaking it in on the plains of Europe and Asia.

All the above statements are mere conjecture, and based on no evidence, for in early civilizations we know that the horse was driven before it was ridden.

Throughout the period covered in this paper, the horse was the most important animal controlled by man. Its uses were by no means confined to great and powerful nations—some of which we have already mentioned—but many little or obscure nations have influenced in some way or another—often considerably—the future of the horse, such as in Ancient Britain where the indigenous horse was very famous long before the Roman invasion.

It is very difficult to find why the horse was so long and so generally kept distinct from agriculture and farm life. It must have been obvious to the ancients how much faster a horse could work on the land than an ox or a mule, but there is no doubt that the horse of long ago was regarded as a companion of man, too powerful and too useful in war to be degraded by the menial life of the farm. It was only in modern times when the progress of civilization was speeding up that man turned his companion into a slave, and the farm-horse appeared.

The present age finds the horse in a state of transition from being man's slave to being banished from the world altogether as a useless

relic of bygone days. Many people gloomily foretell the days when the horse will be no more, and when a few specimens preserved in the Zoo or museum will remind man of the appearance of the friend which assisted him in the dark turbulent days of his youth.

I do not wish to dwell on the controversial question of the future of the horse, which to many people is dark and threatening, but I feel very certain that the horse will always retain the affection of the majority of men, especially for pleasure and on the sportsfield.

LOW FEVER OR SLOW FEVER IN CATTLE. "BASSE FIÈVRE" OR "FIÈVRE LENTE."

By E. J. LAINÉ, M.C., M.R.C.V.S.,
Guernsey.

THE condition I am describing in this article has existed amongst cattle on this island for generations, and is more prevalent than any other, causes more loss to the farmer than any, except sterility, and as yet no one seems to have any idea of its cause. Though it is recurrent yearly or every other year in animals remaining on the island, it has never been observed by English or American importers of animals which have previously been affected. I have never seen the disease described in veterinary literature.

SUBJECTS AFFECTED.—Only animals after calving, whether the first or subsequent. I have seen hundreds of cases but have never known a male to be affected.

SYMPTOMS.—The farmers know the condition so well, that they practically always call one out to a case of "low fever." The patient calved from one to four weeks ago, did well, but has suddenly gone off its feed, and smells of "low fever." The animal is seen tucked up, harsh coat, hide bound, dry nose and mouth, and very foetid smell from the skin, breath, milk and excreta. Temperature is usually normal at first, but in advanced cases becomes subnormal; the pulse varies considerably. The animal walks with a very drunken gait, which in the worst cases becomes most pronounced and the patient eventually is unable to rise without help. The quantity of milk is not diminished to the extent one would expect, but the taste and smell are so affected as to render it unfit for human consumption either as milk or butter. The loss of flesh is always very noticeable from day to day. Appetite is absent as a rule, but one day now and

then the patient eats heartily and chews the cud; the next day it will look at nothing.

Low fever is seldom fatal, but when it is, death is probably due to heart failure. The loss of condition is generally so tremendous as to take months to restore the convalescent animal to its normal state.

Post-mortem reveals nothing macroscopically.

DURATION.—Two weeks to three months.

TREATMENT.—As I have already said, the disease has long been known in Guernsey, and it has been the custom always to give a pint of cider or beer two or three times a day. A patient tethered near a hedge or allowed to run loose in a field will always eat any weed it can get hold of, and these cases do far better than those tethered in good pasture. In the extreme cases gruel and eggs have to be given frequently; in other cases the food should be changed as often as possible. I have tried every kind of medicine it is possible to mention, but now find the best to be one dose of purgative, Aloes Barb. Mag. Sulph., etc., and then give stimulants such as Ammon. Carb., Nux Vom., Zingib, etc., two or three times a day, alternated with the cider or beer.

Uterine injections have been used with no beneficial effects, and any sign of the uterus being affected I have never observed on *post-mortem* examination. However, the first symptom of recovery is œstrum. No treatment is necessary after.

Do any of the readers of this note think the condition is due to the animals being tethered? Is it due to high feeding, or in breeding? I have blamed both these causes as affecting the womb and liver, but have never found any lesion p.m. to verify this. I hope some of your correspondents will suggest some solution.

CAPONING.

By JOHN C. RIX,

Class B Student, Royal Veterinary College, London.

THIS operation is quite a simple one and its results are undoubtedly profitable to the poultry keeper who rears birds for the table. The operation is best performed on heavy-breed fowls if really large capons are required, but satisfactory increases in weight can be obtained from the lighter varieties, such as Leghorns.

XUM

The best age at which to operate is, in the case of heavy breeds, as soon as the sex can be distinguished; and, in the case of light breeds, about two months. If the bird is too old, hæmorrhage often occurs and there is sometimes a difficulty in removing the testicles intact. For the operation an assistant is required, although I have operated on many birds single handed by means of an operating table and hobbles.

The bird should be starved for at least 24 hours before operating, so that the intestines are empty and will not obscure the view. An incision is made between the last two ribs, midway in their length, of about three-quarters of an inch long. The wound is then spread by means of a pair of spreading forceps and the peritoneum perforated. The testicle will be seen in the sublumbar region of the abdominal cavity behind the air sacs. Its removal by means of a pair of caponing forceps is then quite simple, but care should be taken to remove the testicle intact, for if a small portion is left in, it will redevelop and so nullify the effects of the operation. I have always operated on both sides, but I believe it is possible to remove both testicles from one incision. The wound is then closed with one suture and recovery is usually uneventful. After a little practice I was able to capon at the rate of two minutes per bird, although single handed the operation took much longer. Aseptic precautions need not be so stringent when opening the peritoneal cavity of birds, owing, I believe, to their high temperature, this being too high for the thriving of the septic germs.

I caponed 20 of my own light Sussex and Rhode Island Red cockerels (March and April hatched) and the weights of these when killed just before Christmas ranged from 8 lb. to 12 lb. Two of these developed sexual characteristics owing to the incomplete removal of one testicle and their weights were 8 lb. and $8\frac{1}{4}$ lb. respectively. I also had in the same flock with these 15 caponed light breeds of various ages and these showed an increase of one-third over normal weight, at the time of killing, and weighed up to 6 lb. each.

The advantages, other than an increase of weight, are :—

(1) That numbers can be kept together without fighting.

(2) That the birds do not crow.

(3) That the flesh is more tender, and in fact is quite tender up to three years of age.

The appearance of the fowl is greatly changed, no comb or wattles being grown. The bird is quite peaceful in disposition and many have been known to bring up a batch of chicks equally as well as the best " broodies."

OBSERVATIONS ON DAVAINEA PROGLOTTINA IN THE DOMESTIC FOWL—WITH A NOTE ON AMOEBOTAENIA SPHENOIDES v. LINSTOW.

By NORMAN BISSET, M.R.C.V.S.,

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ALTHOUGH *D. proglottina* has received perhaps as much attention and investigation—particularly from Continental workers—as any other worm; and indeed is referred to by Stiles as "one of the few worms which is comparatively well known from a scientific point of view," yet, with the exception of the work of Meggitt, little, if any, literature can be found on the occurrence and effects of this minute cestode of birds in this country.

It is, therefore, proposed to describe in detail an outbreak of disease in a flock of fowls, in which two different types of parasites, viz., cestode and protozoan, combined their attacks, the cestode being *D. proglottina*, and the protozoan *Eimeria avium*. Since that outbreak which was the first occasion on which *D. proglottina* was discovered by the writer, and which occurred in 1924, the parasites have been encountered in an ever-increasing number of cases from different districts in Glamorgan and Monmouthshire. It may well be that, since the outbreak in question, special attention has been directed to the presence or absence of *D. proglottina*, which, owing to its minute size, is easily overlooked, especially when unexpected. The writer may as well confess at once that he was taken by surprise in the first instance, as will appear later.

The fact remains, however, that in the case of every fowl on which a *post-mortem* examination has been conducted, a thorough examination for parasites, both macroscopic and microscopic, external and internal, has invariably been made as a routine procedure, and until the outbreak about to be described, *D. proglottina* had not been observed. Since that time, as mentioned above, the parasites or their posterior segments have been found, in excreta from live fowls, and on *post-mortem* examination in a rapidly increasing number of instances, in all of which the parasites have been quite obvious to the naked eye, so much so that it is difficult to imagine that they could ever have been overlooked.

A considerable number of fowls which had ceased laying, lost condition, and become generally unthrifty, and in the excreta of which numerous posterior segments have been found, have been treated by the introduction into the crop of a teaspoonful of turpentine, the

fowls having previously been fasted and dosed with Epsom salts. These fowls have, in every case, after a second dose of salts given four hours after the turpentine, expelled the parasites in numbers varying from 100 to 300 and in a short time have recommenced laying and put on flesh, the average time taken for recovery being between two and three weeks.

It would appear, therefore, that the cestodes exercise rather more of a detrimental effect on their hosts than has hitherto been supposed.

The outbreak in question occurred in a flock of White Wyandottes, numbering 30 in all. The fowls had all been hatched on the premises, and none had been introduced from external sources. They were of various ages, but those which showed signs of illness were all aged between two and three months.

The symptoms commenced to appear when the birds were one month old previous to which time the whole flock was apparently in perfect health.

Before the writer was consulted two " diagnoses " of the condition had been obtained by the owner from different sources. The first blamed the feeding and ascribed the disease, which, however, was not defined, to the eating of decayed wind-fallen apples. The second reported the cause of the trouble to be coccidiosis. The owner then referred to the writer who visited the premises and examined the flock and its surroundings.

Twenty-three birds were left, but no isolation had been practised. Seven older fowls appeared healthy, but 16 birds of eight to ten weeks old were showing symptoms of disease. They all had the run of a small orchard, about one-sixth of an acre in extent. The houses appeared clean and well looked after. The owner described the symptoms of those fowls which had died as dullness, progressive and rather rapid emaciation, paleness of the comb and skin of the head and a tendency to seek seclusion and to stand for long periods in a " hunched-up " position. Four birds out of seven had " died in convulsions."

An examination of the 16 affected birds confirmed the owner's description. In the houses they stood in the " hunched-up " position in attitudes varying from meditative to miserable, now and again closing the eyes and allowing themselves to be pushed aside by the apparently unaffected birds. The " ruffled feathers " so evident in text-book descriptions of poultry diseases were not noticeable. The tail was drooped and the head sunk between the shoulders. The comb, wattles and skin of the head were markedly anæmic—in most cases quite blanched with no sign of pink colour whatever. The

droppings were watery at one evacuation, apparently normal at another, and slimy and of a reddish colour at yet another. There was, however, no evidence of true white diarrhœa such as is associated with coccidiosis in young chicks.

The birds were very emaciated and extraordinarily light when handled. On being put into the run they attempted to resume their somnolent attitude, but on being forced to move they showed distinct weakness of the legs. Once forcibly livened up and on food being offered, they ate voraciously for a short time and then relapsed into their former comatose state. The eyes when opened were quite bright, but somewhat sunken. The owner mentioned the fact of the appetite being maintained and, indeed somewhat increased, but stated that for about 24 hours before death all appetite was lost.

Bearing in mind both previous reports on the cause of the disease, which had, naturally, somewhat confused the owner, the writer by a little cross-examination elicited the following facts :—

(1) This was the first outbreak of disease of any kind on those premises.

(2) No birds had been introduced from external sources.

(3) The fowls had always been fed in the same way and had always at the proper season had access to the wind-fallen apples, the orchard being their run.

(4) Diarrhœa had been noticed in two instances only out of the 23 affected.

The seven apparently healthy birds were immediately isolated and permission was granted for the slaughter and *post-mortem* examination of what appeared to be the worst case, which was brought to the laboratory for the purpose. The fowl was extremely emaciated and showed all the above-mentioned symptoms, including blanching of the comb and skin of the head.

Post-Mortem.

The internal organs at first glance appeared normal except that the gall bladder was enlarged, and that all fat seemed to have disappeared. The liver was perfectly clean and normal in colour and the cæca were also absolutely normal in external appearance. In other words there were no macroscopic signs of coccidiosis. On closer inspection of the external wall of the intestines, however, small red or purple points could be seen as if shining through from the interior, particularly in the duodenum. When the intestines were opened they were found to be practically empty, containing merely a small quantity of thin watery fluid with which was mixed a little

greenish coloured fæces. The duodenal walls were considerably thickened and the mucous membrane was dotted with petechial hæmorrhages which also, though to a less degree, extended throughout the small intestine. None were present in the cæca. Examination of wet films of the intestinal contents revealed coccidial oocysts. These were fairly numerous, but not nearly to such an extent as one may see in a typical case of coccidiosis in a chick a fortnight old—where the liver and cæca are typically affected.

While the writer was examining the film from the duodenal contents there was a swirl at the edge of the field, and into it came a large body possessing amazing contractile powers and progressing by contracting itself into a ball, followed by vigorous extension. The best description of its movement one can think of is to say that it poured itself along. The body appeared to have neither head nor tail, but it proceeded always so to speak " head " first, i.e., it had to turn round to move in a reverse direction. It was full of minute ovoid bodies. Following it came two others, one of which, however, had attached to the " anterior " end two smaller bodies. On further examination of the film numerous others were found.

The duodenal mucous membrane was then examined by means of a hand lens when very numerous elongated oval bodies could be seen apparently attached to the mucous membrane and standing up on end in the mucus which was adherent thereto.

A scraping from the mucous membrane was examined microscopically. About a dozen minute tapeworms were found in the scraping, some consisting of five segments and others of four. The large " bodies " described above were the posterior segments which had become detached. These tapeworms, which were found to be *Davainea proglottina*, will be described in detail below. All the parasites, or to be more exact, their posterior segments, were very active.

The hæmorrhages in the intestinal wall appeared through the hand lens as if they had been made with a camel hair brush, or as if the cestodes had scratched the mucous membrane with their hooks. As before mentioned, they were most numerous in the duodenum, but were evident the whole length of the small intestine. The parasites also were less numerous in the large intestine and in the cæca none were found. The cæca and their contents, it should be emphasised, were macroscopically normal in every way, i.e., the walls were not thickened, nor were the contents cheesy or inspissated though oocysts were found therein.

Complete five-segmented or four-segmented worms were found only in the duodenum and mostly in the branch connected with the

gizzard. Further down the intestine three, two and one segments were found, but no heads. Where any dark coloured intestinal contents were present the large posterior segments could be distinguished with the naked eye against the dark background and their contractions could also be observed without the aid of a lens. They were much more difficult to see against the actual mucous membrane.

Next day word was received that two other birds had died, one " in convulsions," this in spite of the fact that the fowl examined the day before had been carefully chosen as showing most obvious symptoms of illness. These two fowls were brought to the laboratory and examined. They were also emaciated, anæmic, and extremely light. The crops were quite empty.

As in the first case, at first glance the internal organs appeared normal except for enlargement of the gall bladder and absence of fat ; but in the case of the one which was reported to have died in convulsions the intestine, besides showing the red and purple spots on the peritoneal surface was of a rosy pink colour throughout.

On opening it the mucous membrane of the duodenum presented an appalling condition due to the hæmorrhages. One patch in size about $\frac{1}{2}$ in. by $\frac{1}{4}$ in. near the gizzard was almost black, while the appearance of the rest of the mucous membrane of the small intestine could best be described as dark purple red with minute white points, those being the only parts left of the normal mucous membrane. The contents consisted of tenacious brownish or pinkish mucus in which were clots of blood and lively posterior segments of *D. proglottina*. Through the mucus the hæmorrhages could be seen. The mucoid intestinal contents were lightly scraped away when it was noticed that the hæmorrhagic mucous membrane presented a rather cloudy appearance as though a film were over it. Examination with a hand lens showed it to be so thickly studded with the cestodes that the point of a pin could barely be placed between them. They reminded one forcibly of the papillæ of the mucous membrane of the rumen of the ox. As before, the worms appeared to be standing on their heads, the posterior segments being all that could be seen, although numerous posterior segments and complete worms were lying longitudinally and transversely on top of the others. So numerous were the parasites that it was practically impossible to count them. This " mass formation " extended for almost half the length of the intestinal tract and it is noteworthy that the hæmorrhages were less numerous in the latter half, although in this case they were found throughout the whole length including the cæca. Segments of worms were also found throughout the complete intestinal tract *except* the cæca, but

no heads were found posterior to the end of the extraordinary massed formation. Again there were no obvious macroscopic signs of coccidiosis so far as regards the appearance of the liver and cæca. With the exception of the few isolated hæmorrhages in the latter, they appeared quite normal in every other respect. Coccidia were found, however, in the intestinal contents, but as before they did not appear to be present in excessive numbers.

The findings on opening the intestines of the other fowl corresponded with those noted in the first specimen; hæmorrhages and worms being plentiful and oocysts also being found.

A visit was immediately paid to the affected premises. Exhaustive search was made for slugs (Limax) without result. No marshy land or streams were in the immediate vicinity. It should be noted that no trace of slugs was found in any of the birds examined. Three of the remaining birds which seemed most seriously affected were brought to the laboratory. Two were killed and examined with the same result—abundance of hæmorrhages and cestodes, coccidia present, but liver and cæca and cæcal contents normal in appearance.

The third fowl was kept under observation in a special cage so constructed that the droppings could be easily collected for examination.

(It may be mentioned here that treatment was suggested and drugs were actually procured, but it was found a few days later that the owner had destroyed the remaining birds and burnt the carcasses.)

The droppings of the last-mentioned fowl varied in consistency. Some evacuations appeared quite normal in consistency, but were partly dark green and partly brown or reddish brown. Others were softer, but all were formed to a certain extent, i.e., there was no true diarrhœa. Numerous vigorously moving posterior segments from $\frac{1}{32}$ in. up to almost $\frac{1}{8}$ in. in length could be easily seen on the surface of the droppings. Some were globular like pin heads, and about the same size. The majority were not "crawling about," but were stretching out their anterior portions from the surface of the excreta and waving to and fro very much like a cobra preparing to strike. Within a few minutes, however, they left the excreta and proceeded to "crawl" away from it. Within an hour, on a large tray on a bench top, without the assistance of any additional moisture several of these segments had reached a distance of two feet from the excreta.

This fact was noted from the examination of subsequent droppings, but from the surface of the first evacuation after the fowl had been placed in the cage 65 segments were easily picked off. The droppings were then teased apart, and it was found that the dark green portion was normal in consistency throughout, while the brownish-red portion consisted of blood-stained extremely tenacious mucus with here and

there blood clots and lumps of a clear yellowish jelly. Posterior segments were found in both the apparently normal and the mucoid excreta which were well teased apart and washed with water. In all 114 segments were found in the one evacuation.

An hour later another evacuation was passed and examined in a similar manner, but only 27 segments were picked out. The droppings this time were entirely reddish-brown mucoid material, but were more fluid and not so well formed as previously. From a third evacuation about an hour later but four segments were removed. As this fowl was kept as a source of supply of the parasites no treatment was attempted, and it is remarkable that although it was one of the most markedly affected when removed from the flock and should by all appearances have died within a few days, yet not only did it survive for almost six weeks, but it also lost the somnolent appearance to a certain extent and a slight trace of colour began to return to the comb. At the end of that time it was killed and although coccidia, cestodes and hæmorrhages were found as before, all three were present in a less degree than in the other five fowls examined, as though the natural resistance of the body had been successful to a certain point in dealing with both types of parasites already present when once the host was removed from the risk of fresh infection.

There is probably little doubt that the actual cause of death was coccidiosis, although the absence of lesions on the liver and also of the enlarged cæca with their cheesy contents is rather remarkable. It is, of course, well known that a condition of hæmorrhagic duodenitis may be the only *post-mortem* lesion found in many instances in older fowls, but it has been the experience of the writer hitherto that the enlargement of the cæca with thickening of their walls and cheesy contents is found more often than appears in this outbreak. Coccidia also have usually been more plentiful than in this case.

The large numbers of cestodes were in themselves sufficient seriously to affect the health of the hosts, and there is little doubt that they were the most important agent in predisposing the affected birds to coccidiosis by the innumerable minute wounds inflicted by them on the intestinal mucous membrane. To speak quite frankly, one is not altogether satisfied as to which parasite—coccidium or cestode—should be saddled with the greater amount of responsibility for both lesions and death.

Description of Davainea Proglottina.

As descriptions of *D. proglottina* have already been published, and as the observations of the writer agree with them in practically all respects, it will suffice here to quote the description given by Stiles

(Tapeworms of Poultry, BULL. 12, U.S. Dept. of Agric. Bureau of Animal Industry, p. 47) :—

" Diagnosis : 0·5 mm. to 1·55 mm. long by 0·18 mm. to 0.50 mm. broad. Head club shaped to quadrangular, 140μ to 250μ long by 135μ to 200μ broad. rather rounded in front and slightly constricted in back to form neck (108μ broad) ; apex armed with retractile hemispherical rostellum 55μ in its antero-posterior diameter and 60μ to 85μ in its lateral diameter ; base of rostellum armed with about 80-95 hooklets measuring 6·5μ to 7·5μ Suckers circular, small (25μ to 35μ) armed with a single row of hooklets (6μ), with rather large, bilobed base. Strobila composed of two to five segments, first segment only about 56μ long, the following segments increasing in length and width. Genital pores irregularly alternate, situated at the anterior angle. The second segment possesses well-developed male organs and the anlagen of female organs. In the third segment the testicles are atrophied, the female organs (median posterior vitellarium, two ovaries, recept. sem. vagina) well developed, but no uterus present. In the fourth segment all the genital glands are atrophied, and the segment is filled with numerous isolated eggs (not in egg capsules), ova 35μ to 40μ ; hooks of oncosphere 10μ to 11μ, The segments have a great tendency to separate more or less completely ; the last segment, after separating, remains in the intestine and grows to 2 mm. long by 1·25 mm. broad (larger than the entire worm)."

To the above description the following observations on the worms found in the foregoing cases may be added :—

LENGTH.—Several complete worms were found to be 2 mm. in length.

NUMBER OF SEGMENTS.—No two-segmented worms were found. The average number was five, but fours were also common. This applies to the obviously complete worm. Numerous three-segmented worms were observed from which the posterior segment had apparently just separated, but as these might have been accidentally broken they were not considered. The total length of the cestode depends, of course, on the number and size of the segments, particularly the size of the posterior segment.

SUCKERS.—The suckers are four in number and agree in dimensions with Stiles's figures, but the hooklets surrounding them are in triplicate and not in a single row, as they are found round the base of the rostellum. The hooklets are shaped like a hammer.

THE POSTERIOR SEGMENT.—This segment appears to be the most important part of the whole parasite. Indeed, it is not exaggerating

very much to say that it appears to contain the " intelligence " as well as the motive power. The penultimate segment shows feeble contractile powers, but in those anterior to it no movement whatever could be observed. They appear to be pushed this way and that at the " will " of the posterior segment, which shows amazing energy, becoming alternately globular and then linear, as it pours itself along, pushing its unresisting " passengers " in front of it, as it would do when free in the lumen of the intestine. The posterior segment is completely filled with eggs containing oncospheres.

Separation of Posterior Segment.

The separation of the posterior segment from the rest of the strobila is by no means a simple deciduous process like a dead leaf falling from a branch, and it is interesting to watch under the microscope the casting off of the posterior segment or rather the casting off of the anterior segments by the posterior, for that appears to be a more accurate description of the process.

It must be borne in mind that the description applies to a parasite examined *super vitrum*, i.e., on a slide.

As before mentioned, the penultimate segment shows comparatively feeble contractile powers during progression. When the time has come for the posterior segment to separate, the other segments including the penultimate become quite immobile. The posterior segment then increases its contractions, and, as it pushes forward, first with long steady strokes, and then with little jerks, as if it were indeed sentient, the anterior segments fall slowly to one side. The sticky tenacious mucus apparently helps to some extent in the procedure by retaining the anterior segments, while the posterior segment tears itself away. After a little time the posterior segment seems to become tired, the contractions become slower, and finally cease for a few seconds. Then with redoubled force they recommence—long steady strokes, alternated with jerks, the anterior segments falling more and more to the side. It would almost appear at times as if the posterior segment were shaking its " head " like a terrier with a rat, as if in annoyance with the encumbering anterior segments. Under the microscope one can distinctly see the segment literally tearing itself slowly from the penultimate, and notice the glutinous strands between them gradually stretch as toffee stretches in pulling, until they finally part asunder and the anterior segments, united to the posterior only at one edge, hang straight down the side of the latter. It may be remarked here that in all cases the posterior segment at the time of separation was about one-quarter longer than all the

remaining segments. This was forcibly brought to one's notice at the above stage of the proceedings, namely, when the anterior segments were hanging down the side of the posterior.

The succeeding stage appears to be the most difficult (to a worm free in the intestine). The posterior segment again ceases its contractions for a few seconds. Then suddenly it appears to get into a fury, pushing upwards, sideways and forwards with tremendous energy, until it is finally freed from the other segments which remain passive in the mucus, while the posterior segment " pours " itself away at an amazing speed.

Six separate worms were watched go through the above process, and in each case the method of procedure was identical. The time taken in each case was three-quarters of an hour from the time when the anterior segments, or rather the penultimate segment, became immobile.

In the intestines of the live fowl the head of the cestode, in many cases (but not in all) would probably be fixed in the mucous membrane, thus rendering the procedure easier and probably more rapid. It must be remembered, however, that numerous complete, live cestodes were found free in the lumen of the bowel and it is to these that the foregoing description refers.

Although the segments left behind were watched for some hours after the secession of the posterior segments, no movement was observed in any of the six cases.

Egg of D. Proglottina.

The egg of *D. proglottina* measures between 35μ and 40μ, and is globular in shape. It is surrounded by a thin transparent cuticle and contains an oncosphere with six hooks, the latter apparently always on the top as they are always visible. Under the one-third objective they look like minute cracks or folds in the cuticle of the embryo. Under the high power one-sixth objective, they are seen to consist of an arm at the end of which is the actual " hook," like a crescent applied to the tip of the arm, the whole measuring between 10μ and 11μ. In some cases the oncosphere does not appear entirely to fill the egg. In such cases careful focussing and illumination adjustment will show two or three apparent lines radiating from the oncosphere to the inner wall of the external shell of the egg. Closer examination will show that these lines are actually deep folds in an intra-ovular sac. In the cases where no such arrangement is observed, and where the oncosphere apparently fills the entire egg, the " sac " is actually surrounding the oncosphere and is attached to it at the posterior end, the folds in the sac being obliterated.

A posterior segment was taken from some fæces immediately after evacuation, placed in a drop of water, under a cover-slip and examined under the microscope. It was quite full of eggs and showed pronounced contractile powers. In less then five minutes the contractions ceased and the segment ruptured at two points on either side of the anterior end. As it was suspected that the early rupture of the segment was due to pressure of the cover-slip another segment was placed in a drop of water in a hollow ground slide and the cover-slip again applied, but this time there was of course no pressure exerted on the segment. The contractions and expansions of this second segment continued for two hours with slight intervals of rest; the movements gradually become slower, and the intervals of rest longer until at the end of this period the segment ruptured in the same places as in the first case. During the movement of the segment the eggs within it could be seen tumbling over each other. When the contraction ceased, previous to rupture of the segment, careful examination showed hooks of the oncospheres in motion and a considerable number of oncospheres showed contractile movements within the eggs.

From the ruptures in the segment eggs were extruded with a certain amount of force as if expelled by pressure from behind. A little later another rupture took place in the main mass, from which numerous ova also were extruded.

The Embryo of D. Proglottina.

In all literature on cestodes to which the writer has had access, it is stated that, before the oncosphere can be liberated from the egg, the shell and embryonic envelope must be digested away by the gastric juices of the intermediate host. Leuckart (" The Parasites of Man," p. 338) states that " a spontaneous liberation of the embryo does not occur in the Tæniæ."

In about 60 per cent. of the eggs of *D. proglottina* examined by the writer this was not found to be the case. On the contrary, within five minutes after extrusion slight movement of an oncosphere within the egg was noticed. As mentioned above some oncospheres were showing movement whilst still within the segment. A watch was kept on one egg in which the oncosphere was moving at the time of extrusion. The oncosphere first contracted slightly, the movement exactly resembling a slight shrug of the shoulders. It then began to contract the whole " body " and to elongate it much in the manner of the posterior segment. Slowly the contractions and expansions became more pronounced, and as the anterior end was thrust forward the hooks came into play, catching in the envelope of the egg and at

times apparently penetrating it. The movement of the oncosphere gradually became more violent until, with a noticeable jerk the " egg shell " ruptured and the anterior portion of the oncosphere with its hooks shot out of the egg. The posterior portion was then withdrawn, but more slowly, and again careful focussing and illumination showed that this slowness was due to the fact that the sac before mentioned was adhering to the posterior part of the oncosphere. The whole procedure took from half to three-quarters of an hour.

Once the oncosphere was free of the egg it " swam " vigorously and quickly away, the body contracting and expanding energetically and the two pairs of hooks at the sides being thrown forwards and outwards at each extension, exactly like a person using the breast stroke in swimming, the central pair of hooks having an up and down motion like a navvy using a pick. As already mentioned, the hooks are at the end of a stiff arm which appears to be attached to or inserted in the protoplasm of the anterior portion of the oncosphere. Each arm with its hook can be moved separately, but not as an animal moves its limbs. On the contrary, it seems as though the arms were merely loosely attached and were thrown almost aimlessly at each vigorous extension of the oncosphere. Their movement is reminiscent of the baton as wielded by Punch or rather of Punch and the baton combined. As they are thrown out sideways and forwards, they catch in surrounding objects and material, and also in neighbouring eggs and thereby assist in the progress of the oncosphere. The body of the oncosphere shows practically no structure, but appears to contain refractile granules. There are two markings resembling ridges or grooves in the middle of the posterior half on the dorsal surface.

The free oncosphere proceeds straight forwards. One came full against the posterior segment, which still contained large numbers of eggs and by thrashing about with its hooks within a very short time tore an opening in the segment through which more eggs escaped. Another in its travels came up against an egg containing a moving oncosphere, but instead of turning aside it contracted and extended more vigorously than ever, the hooks catching in the envelope of the obstructing ovum, apparently by mere chance it was pulled to one side and the oncosphere proceeded on its way. It is rather remarkable in view of the previous observation that in spite of the vigorous play of the hooks of the free oncosphere they did not tear the " shell " of the ovum which they were attempting to pull out of the way.

After leaving the egg the oncosphere is oval in form, although it is never still enough to say exactly what definite shape it is during

life. The energy it displays is extraordinary. One which had become fixed in some debris contracted and expanded without the slightest intermission for three hours, at the end of which time, when its observation had perforce to be abandoned, it was still as vigorous as ever.

The raising of the temperature of the air surrounding the microscope by means of one or two lighted Bunsen burners, appreciably increased the rapidity of "hatching," and the activity of the oncospheres both intraovular and free, but in spite of this about 40 per cent. of oncospheres within their respective eggs showed no movement at all. Next day, however, no movement whatever could be observed in either the free oncospheres or in those within the egg.

The above observations give rise to several interesting speculations. Why do 60 per cent. of oncospheres hatch out and apparently die in 24 hours, while 40 per cent. remain unhatched? Is it a provision of nature to prevent over-reproduction of the species? In other words, are the 40 per cent. destined to carry on the race and are the 60 per cent. merely the surplus? If so, what factors influence the viability of the oncospheres? The last question may be partially answered by mentioning warmth and moisture which undoubtedly increase the development of movement in the oncosphere. On the other hand, the same degree of warmth and moisture was experienced by all the eggs in spite of which some did not react at all.

Grassi and Rovelli state that the slugs will eat segments of *D. proglottina* in preference even to cabbage leaves. To test this assertion several slugs (*L. agrestis*) were placed in a petri dish containing a definite number of segments, and small pieces of cabbage leaves. In spite of the fact that the leaves were occasionally removed and the slugs given no other food, the latter could not be induced to eat the segments. The experiment was continued for 14 days, the segments being carefully counted and replaced by fresh ones as they disintegrated. It may be that the foregoing authors were deceived by the spontaneous disintegration of the segments, and imagined that such segments had been devoured by the slugs.

Apropos of the hæmorrhagic condition of the intestines as exemplified in the outbreak described it must be remarked that similar hæmorrhages have been observed in numerous other cases since examined where *D. proglottina* was present in very large numbers, but where there was no sign whatever of the presence of *Eimeria avium*.

In several cases also where *D. proglottina* appeared undoubtedly to be the cause of illness, marked vertiginous symptoms have been observed.

In one such outbreak, sections of the intestinal wall when examined microscopically, showed the cestodes to be present in very large numbers in the depths of the mucous membrane between the glands. Although complete worms, i.e., possessing posterior segments, they were so small that no part of them projected into the lumen of the bowel and consequently they escaped observation by the hand lens.

Amoebotaenia Sphenoides.

This minute tapeworm was first recorded in this country by Meggitt ("On the Anatomy of a Fowl tapeworm *Amoebotaenia sphenoides* v. Linstow," Parasitology, Vol. VII, No. 3, November 9th, 1914, p. 262). The writer has been unable to find any references to its occurrence in this country since that date.

In six fowls from various parts of Glamorganshire he has found this parasite. In five of these instances it was associated with *Davainea proglottina*, but was the only type of cestode present in the other case, from which 12 complete specimens were obtained.

A CASE OF INTERSEXUALITY ASSOCIATED WITH DICHOTOMY OF THE CAUDAL REGION IN THE RABBIT.

By J. N. PICKARD,

Animal Breeding Research Department, University of Edinburgh.

A TYPICAL Blue Beveren rabbit, well-grown for its age (16 weeks) was received on December 14th, 1926, from Mr. M. G. Jennings, of London. It was one of a litter of five, of which three were apparently perfectly normal, one which persistently held its head on one side, and the rabbit herein described, which was grossly abnormal and exhibited permanent torticollis. Both parents were normal and not closely related.

On examination it was noted that it had two tails, two ani, and two penes. A penis had its origin at either side of a mass of firm tissue covered with hair and situated immediately below the true tail. There was, however, no bone present in this second tail. An anus was also found behind each penis. Urine was evacuated through either penis. The testes were never descended during life, and the

animal never showed any sexual interest towards the female, for the reason, as was then thought, that it was not sexually mature.

Post-mortem examination revealed the fact that the animal was an hermaphrodite. Testes ($3 \times 1 \times 0 \cdot 25$ cm.) lay in the primitive position within the abdominal cavity. They were associated with apparently normal, though elongated, epididymes. Both testes were reddish in colour and appeared heavily congested. Spermatic cords of normal relationship were present. In addition to the testes there was a uterus. A uterine horn passed from the base of the epididymis on either side and the uterus was completely separated, the two halves opening independently into the single vagina by a very narrow

FIG. 1. Photograph of the Caudal Region showing duplication of penis and tail.

cervical canal. The vagina was exceedingly distended with a white fluid and appeared to have the form of a blind sac. The prostate, containing a similar fluid, was attached to the distended vagina. This being so, it was reasonable to assume that the whitish fluid found in the vagina had been secreted by the prostate.

From the base of each epididymis a ligamentous cord ran down to, and vanished into, the abdominal wall on either side. Since no definite vas deferens could be identified and since this ligamentous structure showed some similarity to the normal vas, it was thought that this was indeed an ill-developed and abnormally related vas. The bladder was in duplicate, the two sacs being divided completely

by a wall. Each chamber was connected with the penile urethra of the same side. During life some whitish fluid was observed to pass from each penis ; whether or not this came from the distended vagina must remain uncertain since careful examination failed to disclose

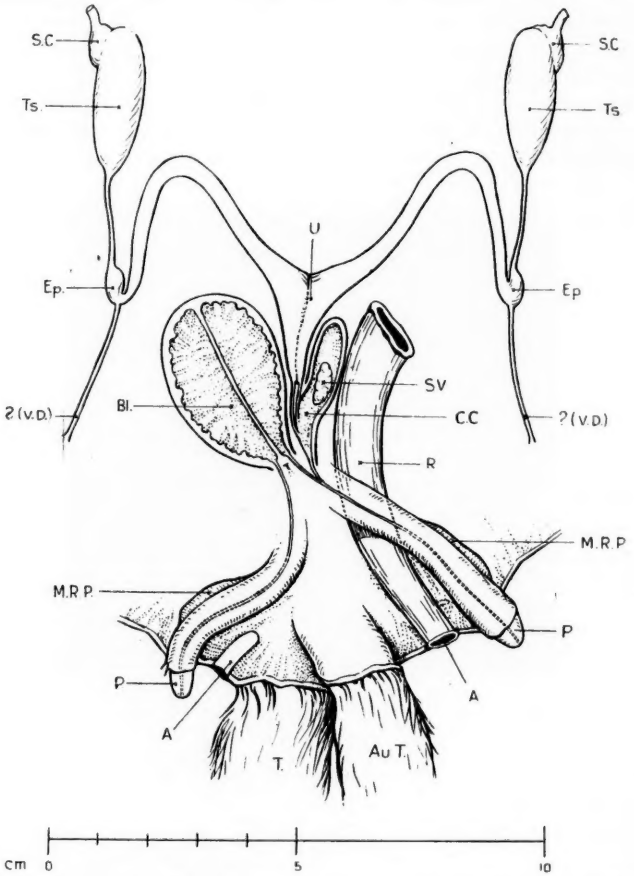

FIG. 2. Diagram of Reproductive System. A. = Anus, Au. T. = Auxillary tail, Bl. = Bladder, C.C. = Cervical canal, Ep. = Epididymis, M.R.P. = Retractor penis muscle, P. = Penis, R. = Rectum, Sc. = Spermatic cord, T. = Tail, Ts. = testes, U. = Uterus, V.D. = Vas deferens.

any communication between the vagina and urethra. The penes were quite normal in structure, but the prepuces were not properly formed, the condition of hypospadias being present. The accessory

tail was attached to the root of the main tail by ligamentous structures, but no bone was present therein. The main tail was quite normal in structure. There were two ani, the left one communicating with the rectum normally, the one on the right of the main tail being a blind invagination (1 cm. deep).

Histological Examination.

TESTES.—Both testes exhibited a structure typical of the cryptorchid condition and germinal cells were absent; only a few sertoli cells remained intact. There were no signs of spermatogenesis and no spermatozoa could be found. The lumena of the seminal tubules were filled with cells whose nuclei were highly hyperchromatised, and had been desquamated thereinto. The basement membrane of the tubules was very thin and interstitial tissue could not be found. In some parts the seminal tubules had already degenerated and disappeared, the basement membrane persisting. Capillaries were abundant throughout the testes amongst the seminal tubules. This would account for the reddish colour at the time when the *post-mortem* examination was made.

EPIDIDYMES.—These were of normal structure.

UTERUS.—The muscular layer was somewhat thin, whilst the mucous membrane consisted of a single layer of epithelial cells. Many longitudinal folds similar to those found in the Fallopian tubes were encountered.

Discussion.

The case is of interest in that it would appear to present the conditions of intersexuality (a combination of male and female structures of the reproductive system) and of dichotomy of the caudal region of the body (tail, anus, bladder, urethra, and penis being duplicated). Hypospadias was also present. The abnormality of the vasa deferentia is of interest and must have rendered the animal sterile even had the testes descended later. The cause of the wry-necked condition is not understood.

This account is given with the intention of attracting the interest of breeders to this type of abnormality in the rabbit: a single case cannot provide much material for interpretation, but a series of similar cases might easily reveal the nature of the conditions exhibited. Intersexuality of this kind is known to occur in other forms.

THE TREATMENT OF METRITIS BY IODINE VAPOUR IN SMALL ANIMALS.*

By M. S. MIGLEY, D.V.M.,
Paris,
AND
M. S. TERLIKOWSKI, D.V.M.,
Varsovie.
(Clinic of Professor Robin, and Laboratory of Professor Panniset, Alfort School.)

THE classic therapy of uterine affections consists in repeated irrigations of the cavity of the affected organ with different antiseptic solutions such as permanganate of potash, hydrogen peroxide, alkaline hypochlorites and iodised water, etc.

Some authors like antiseptics in powder form, such as dermatol, iodoform, tannoform, given by insufflation or included in gelatine capsules, whose destruction liberates the powder which afterwards spreads over the uterine mucosa.

Really, these medications, whose efficacy can be understood as regards the larger female animals, are frequently inoperative in the bitch or cat. In these races, in fact, the uterine horns are long, narrow, flexuous and often contracted at certain points; antiseptic liquids, and certainly topical powders do not reach the anterior extremity, even if inserted with the hind end of the patient lifted up at the time of injection. On the other hand, the stagnation of the solutions employed in the recesses of the uterus may occasion intoxication accidents, especially when the antiseptic is badly chosen. In fact the cure of acute or chronic metritis is so contingent that too often hysterectomy has to be performed, which in spite of present-day perfect technique, always remains a dangerous operation.

We have sought to bring about uterine antisepsis by iodine vapour, a procedure used for a long time in human medicine. From the first we have considered that with this method, the uterus being distended by the action of the air blown in, it would be possible to impregnate the uterine mucosa with iodine up to the ends of the cornuæ. From experience on a bitch submitted to this medication and killed immediately afterwards, it has been possible by the usual reaction, and notably by the use of starch, to prove the total impregnation of the endometrium, whereas with a test by Lugol's solution it was shown that the injection only passed a few centimetres beyond the

* *Rev. Gén. de Méd. Vét.*

origin of the uterine horns. To obtain antiseptic vapour we had to use a test tube containing metallic iodine, at the rate of two to three centigrammes of iodine per kilogram of animal. This tube is closed by a cork stopper, into which two glass tubes are inserted : one is connected to the bellows of a cautery ; the other is connected by an india-rubber tube to a glass canula. The test tube is carefully heated by means of a spirit lamp ; when the violet vapour commences to arise, the canula is introduced into the uterus of the bitch, previously fixed, and one works the bellows until volatilisation of the iodine is complete, taking care to move the canula from time to time to ensure the diffusion of the antiseptic on all the surface of the wall. It has appeared useful to us to precede the first insufflation with an abundant irrigation of boiled water.

The method described has been applied on eleven females—nine bitches and two cats. Some of them showed a purulent discharge, observed for more than four months. In all cases the neck of the uterus has been sufficiently dilated to allow of easy introduction of the canula without hysterectomy. In two cases the vaginal mucosa, congested and tumefied, showed large ulcers in the neighbourhood of the urinary meatus.

In the majority of the subjects the general condition was quite good ; in four cases the invalids were very thin and depressed, appetite gone, temperature up to or over 40° C.

The first insufflation is constantly followed by a remarkable betterment in the condition ; less marked in the worst cases ; the thermic curve descends to normal ; the appetite recovers ; the subjects are more lively ; the discharge loses the abominable odour which characterises it in certain cases and diminishes considerably. The insufflations are repeated every two days, until cure is complete, on an average from the eighth to the fourteenth day. We have never observed the slightest sign of intoxication ; nevertheless, we desired to know whether iodine thus vaporised was absorbed by the uterine mucosa or passed in the urine ; the reaction to chloroform and nitric acid has constantly given a negative result.

The regularity of success which we have obtained by the use of this medication to the exclusion of all other local or general treatment, as well as the simplicity of the method and its harmlessness, induces us to conclude that iodine vaporisation has a clear superiority over all other procedures in the treatment of metritis of small animals.

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OPPOSITION TO THE USE OF THE MECHANICAL KILLER.

THE Barnstaple Town Council recently passed a resolution by 10 votes to 9 against making the use of the mechanical killer compulsory as a means of humane slaughter; and at a subsequent meeting held on June 27th, the minutes containing this resolution were confirmed and signed by the Mayor.

AN UNUSUAL DYSTOCIA.

By PETER MEIKLE, M.R.C.V.S.,
Strathaven.

I RECEIVED an urgent call one night recently to attend a calving case. I set off as soon as possible with my assistant, and on arriving at our destination a rather alarming condition presented itself.

SUBJECT.—Ayrshire heifer that had been served by a large Friesian bull.

My client admitted that as far as he could see the presentation was perfectly normal (anterior presentation), and that he had applied considerable traction, so much so that the animal had knocked both horns off during the process, the calf which was an extra big one had become wedged at the hips and would not move. Thinking he could manage to turn the hind legs he cut the calf in two just behind the shoulders, and then found it would not move and was impossible to turn and sent for us. By the time we arrived the hind legs had become gassed and stiff, all natural lubrication gone, we decided to first inject soap solution and try traction with a hook on the pelvic bone, the animal being turned over on its back, this was not successful; as we had not an obstetric chisel we began to dissect away first the vertebræ as far as the pelvic bone and then the pelvic bone itself; this we managed to do, my assistant and self each taking a spell after about two hours' tedious work, when delivery of the hind legs was comparatively simple. Although the animal was badly torn in the vagina and vulva, which necessitated attention for about a week after she made a good recovery.

Clinical Articles

An Interesting Fracture of the Humerus.

By A. SCOTSON, M.R.C.V.S.,
Market Rasen.

SUBJECT.—A two-year-old shire colt.

HISTORY.—Last February my client, the owner of the colt, made it a daily practice to turn out two colts for an hour's exercise during the severe weather. On the occasion I am referring to both colts were turned out as usual into a field adjoining the farmyard.

The colts made off at a gallop down the field (which is rather hilly) to a gateway at the bottom. The owner, who was watching, told me that about 20 yards from the bottom gate one of the colts swerved to the left, the other made to follow, but suddenly stopped and as he did not offer to move the owner went to see the reason and found the colt unable to move. When I arrived the colt was breathing heavily and in great pain—there was no difficult in finding the cause nor yet hesitation on the owner's part in having the colt destroyed. *Post-mortem* examination showed a fracture practically separating the humerus into two equal parts. The humerus, which was a heavy type, showed no signs of disease.

Fracture of the Basi-Sphenoid.

By WILLIAM A. AUSTIN, M.R.C.V.S.,
Devizes.

ON Sunday, December 19th, 1926, about 9 a.m., I received an urgent telephone message to attend as quickly as possible to destroy a horse which was thought to have a broken back. The animal, a three-year-old thoroughbred gelding, had taken his usual feed at 7 a.m., and was perfectly normal at that time. As other horses were leaving the yard, a noise was heard from the direction of the loose box in which he was, and on investigation he was found down on the ground. On my arrival I still found the animal down, sweating profusely all over, struggling violently, and bleeding from both nostrils. I was unable to find any definite evidence of fractured vertebrae, but gave an opinion that the cause of the symptoms was either from a fractured skull or haemorrhage of the brain, or both. I gave a hypodermic injection of morphia, and after about 10 minutes the animal was got on to his feet, but made a complete somersault backwards

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and fell out into the yard. He was made as comfortable as possible on some straw, and cold water was applied to the head. After a further 15 minutes he got on to his feet again and walked fairly steadily back into the box. When I left he was standing quite quietly, and I gave instructions that should he become violent again, he might have another morphia injection. During the afternoon he drank some tepid water and ate a small bran mash, but late in the evening violent symptoms again developed and the morphia was given. On visiting next morning I found the horse still standing, but with his head in one corner of the box, quite blind and in a state of stupor. I informed the trainer that there was no hope of the animal recovering, but as its owner was coming to see him, we decided to wait. Later in the day the animal again went down, and I destroyed him with Hydrocyanic acid, in order that the brain should not be damaged. On *post-mortem* examination all internal organs were found to be healthy, but a dissection of the skull showed a complete fracture of the Basi-Sphenoid bone.

Fracture of the Basi-Sphenoid Bone.

Compound Comminuted Fracture of Lower Jaw.

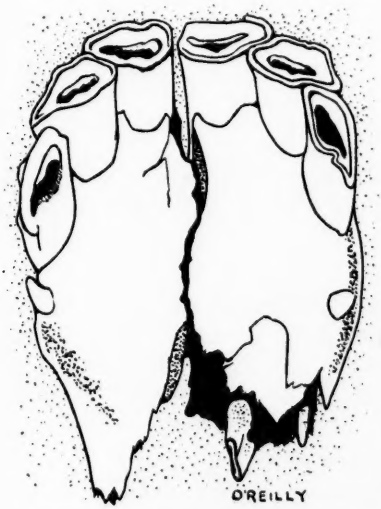
By J. W. PRITCHARD, M.R.C.V.S.,
Brighton.

SUBJECT.—Bay Welsh cob, 14 hands, belonging to a fish hawker, serving a long-distance country round.

HISTORY.—During the evening of Peace Celebration (July, 1919) the owner, when driving the cob, came into collision with a motor omnibus, causing a complete comminuted fracture through the neck of the inferior maxillary bone.

TREATMENT.—A mouth gag was employed, the injured area well cleansed, codrenine applied, and the rugged edges of the injured bone were sawn off to make a smooth stump, so that the overlapping soft tissue could be sutured together. A dose of anti-tetanus serum was administered.

The diet ordered was long soaked bran mashes and well scalded soft hay; and the mouth was flushed several times daily with saline solution.



The portion of the Lower Jaw which was removed.

I attended the case from July 24th to August 2nd.

The cob has had good health and has been in regular work ever since. The enclosed snapshot was taken April 7th, 1927.

Precaution has to be taken to see that the bit is well up on the tongue when working, and although quite capable of manger and rack feeding, the animal cannot feed out at grass owing to the loss of lower teeth (nippers).

Œsophagotomy in a Puppy.

By A. SCOTSON, M.R.C.V.S.,
Market Rasen.

A FORTNIGHT ago a client brought to the surgery a collie pup just weaned and choking. On examination two large protuberances were felt just below the pharynx.

As it was impossible to remove the obstruction per mouth, a slit was made into the œsophagus, and with gentle manœuvring the bone was removed. It was part of a vertebræ from a pork chop and measured one and a half inches across by one and a half inches to the end of the spinous process, which latter was the first portion to be swallowed.

The operation wound was well cleansed and not sutured. The patient made a satisfactory recovery.

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Vesical Calculi in a Bitch Two Years Old.

By HERBERT BUCKINGHAM, M.R.C.V.S.,
Norwich.

A CAIRN bitch, two years old and fat.

Frequently placing herself in position for the purpose of micturition and straining unduly.

Upon examination I found a number of small calculi upon the hairs surrounding the vulva, adhering very loosely by means of fresh moist mucus. I presume nature had forestalled me, by evacuating them from the bladder and urethra of her own accord, without my help.

I could not find any sign of more, and as she passed urine naturally, I let it be at that. She has been no trouble since.

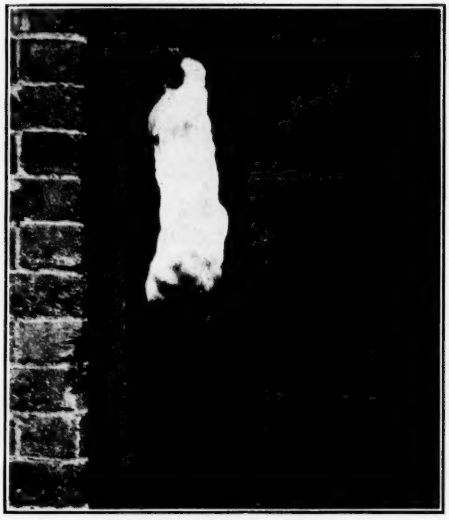
This is the second case of a similar nature which I have had this year.

I do not remember having been lucky enough to discover calculi in that position before.

Notes on Feline Intelligence.

By A. PERCIVAL,
Worthing.

THE photograph is that of a Siamese cat, "Saintly" opening a door, which she would do several times daily, with a jump of about



"Saintly," a Siamese Cat, turning the door handle.

four feet. She would clasp the handle with her left paw, keeping her

right one on the latch and has left hind leg against the door post. Simultaneously with a pull on the latch, she would push the door open with left hind leg.

When "Saintly" has kittens she has them around the door and leads them out in the garden to teach them their sanitary arrangements. She now lives here in my bedroom at Worthing, and is still just as keen on opening doors, but has to be content with an enamel bath containing cedar shavings for sanitary purposes. She is very particular to place her babies right in the bath to relieve nature and to sit by the kitten until finished, when she at once gets into the bath to see what has happened and covers whatever is present on the shavings.

"Miowne," a Siamese Cat, attracted by music from a loud speaker.

"Saintly" is also well known in the Cat Fancy on account of her reputation as a dancer. This is really a peculiar movement of the hind leg naturally inherited from her grandfather, "Prince Souti." "Saintly" always does this dance when she is excessively pleased or when certain refrains are sung to her.

She is a very keen ratter, also a good rabbiter, and will, after killing, bring home rabbits almost as large as herself.

The second photograph shows "Miowne," another Siamese cat, who is fond of music.

Last summer I had wireless installed in the hotel, and on several occasions was called into the Lounge to see "Miowne" on the table

most interestedly listening to the music, and when a soft soprano or tenor was in the programme she would bury her head in the loud speaker.

I took some snap-shots, but the cat's head could not be seen, the markings being of the same dark colour as the loud speaker. I therefore, took the accompanying photos when she was just listening some distance away with her head on one side, enraptured with the melody.

An Interesting Cause of Bladder Obstruction in a Cat.

By HERBERT BUCKINGHAM, M.R.C.V.S.,
Norwich.

A LARGE common male castrated cat, 13 years old, was brought to me in a dying condition. I was asked to "put it to sleep." I did so and then made a *post-mortem* examination.

Several years ago it was brought to me because it "had a swelling on its body." This swelling was an umbilical hernia. Nothing was done to the lesion, because it was causing no inconvenience, and an operation was objected to.

Now the external tumor was quite as big as a cricket ball, not quite so deep, and a little more spread out. The peritoneum was inflamed, the cavity had become more or less part of the abdominal cavity, and there was no definite line of demarcation. Inside that cavity, to my surprise, I found a full bladder, containing five ounces of urine, and around the neck of the bladder was twisted four inches (doubled) of bowel, which prevented the bladder from being emptied.

There was no sign of inflammation or disease in either the bowel or bladder.

Translations

Parenchymatol "Atarost" Against Mammitis.*

By VETERINARY SURGEON LIDSTRÖM,
Tingaryd, Sweden.

MASTITIS and its treatment are veritable stumbling blocks to the practising veterinary surgeon. Poultices, fomentations, ointments, internal medicine, infusion through the teat canal of boric acid solution, hydrogen peroxide and other antiseptics, now recently Rivanol solution (as recommended by Professor Vennerholm, of Stockholm) as well as albumen therapy, are in all too many cases unsuccessful.

In the spring of 1925 repeated cases of mastitis occurred in my practice and in quite too many cases the stricken cows showed pitiable results in spite of rivanol treatment, etc.

A prospectus from the Atarost factory in Rostock, Mecklenburg, Germany, had reached me, which advised me to try Parenchymatol preparations, and I have never regretted using them. Very good results are achieved. There are many Parenchymatol preparations. The simplest and cheapest is an acridin-thionylchloride preparation. Of this preparation 100 c.cm. is injected intravenously, parenchymatously or subcutaneously. In the latter cases not more than 10 c.c. must be injected at each needle puncture. More recently I have been using another preparation called parenchymatolhefe, partly as a result of its better effect and partly on practical grounds. Only 50 c.c. is used and only five subcutaneous injections are necessary locally on the attacked parts of the udder. I have found this method of application the most effective and best. Parenchymatously injected, it causes quite œdematous infiltrations in the parenchyma and intravenously given it has not such a quick local effect. The preparation is a green, odourless, non-poisonous fluid. Its effect is somewhat as follows :—

"Parenchymatolhefe is a combined specific and non-specific œdema stimulant with a potent effect. This preparation is especially valuable on account of its nuclein contents and through this being deposited in the cells of the organ by the leucocytes, it acts as the carrier of antitoxic attributes to the organism. It has been proved that this preparation attacks the bacterial toxalbumen in the organism and makes it harmless, generates agglutinating material and alexine and that the blood after hefe injections assumes strong bacteriolytic

* Berliner Tierarzt Woch, Jan. 21, 1927.

attributes, whilst the bactericide effect of the blood increases with the number of the leucocytes. The injections cause at first a short continuing leucopeuia, then strong leucocytosis sets in, which through corresponding injections evokes an increased and continuous hyperleucocytosis. Parenchymatolhefe injections in overdoses cause no general disturbances, the condition of the animal is quite quickly improved."

The remedy is recommended for all forms of mastitis (catarrhal infections, interstitial, parenchymatous, but not for tuberculous).

Some typical cases in cows :—(1) One quarter of the udder swollen, milk flocculent, temperature 39·7 C. Treatment, 50 c.c. parenchymatolhefe subcutaneously. On the following day the milk appeared normal. After a week the quarter was normal and in full lactation.

(2) Two quarters attacked, hard, œdematous swelling. Secretion discoloured, bad-smelling and flocculent. Temperature, 41·2 C. General condition much disturbed, no appetite, no rumination or mastication movements. On the day after treatment the temperature was normal. The animal ate and ruminated as usual, the milk was almost normal. The swelling continued 14 days, but milk secretion was normal before this. On the same holding two other cows were slightly affected, both were treated and recovered.

(3) The whole udder attacked and swollen. The secretion small and clear water colour. Temperature, 40·8 C. General state very bad. The cow could not get up, neither ate nor ruminated. Treatment 80 c.c. of parenchymatolhefe subcutaneously and heart and fever remedies. On the following day the cow was up and ate a little. Temperature, 39·7 C. Secretion a little whitish. After three days apparently normal milk. The œdema lasted four weeks. The amount of milk during this lactation period was not normal.

(4) The parenchyma for some length of time lumpy to the feel, the milk quite normal in taste and smell. Tested for tuberculosis at the School. Reply streptococcic mammitis (apparently insidious and chronic). Treatment parenchymatolhefe 50 c.c. After four weeks better. The treatment was now repeated. After further two months, healthy.

In acute mastitis in cows, treated with parenchymatolhefe the general condition quickly improves and the milk becomes normal in most cases after 24 hours. Swelling continues longer—one to four weeks. At first I also used Burows' ointment, but this can be discarded. Milking out must be done oftener than usual as long as the swelling continues.

Against mastitis in sows I have also used the remedy with good effect. Dose, 20 c.c. subcutaneously.

In mares I have not been in the position to test the preparation. (Parenchymatolhefe should be useful in other maladies, e.g., swine erysipelas, 6 c.c. corresponding to 10 c.c. of serum. In the few cases where I have tried it I have had good results.—G.M.)

Observations on the use of Ovarian Extract in Atony of the Ovaries of Cattle.*

By EDUARD DOLDER, Veterinary Surgeon.

THE author has conducted 21 tests with ovarial extracts on cows suffering from hypofunction or afunction of the ovaries.

The symptoms shown have been total absence of œstrum, too long periods between the recurrence of œstrum, or such slight symptoms of heat as not to be noticed by the animal owner.

Cows in which this form of sterility has been noticed have been from four to nine years old without exception. The genitalia in such cases often seem almost normal in form, size and position, but mostly as a whole they seem considerably diminished in size.

Thus Stäheli writes on the subject: "On the surface of the ovaries no palpable follicles or corpora lutea can be established. The surface appears smooth. Atrophy may cause reduction to the size of a pea. The uterus becomes smaller. We find the horns of the uterus in several cows scarcely more than finger-thick and their length considerably reduced. Also the cervix shows considerable diminution in length and breadth. The palma plicata appears effaced; the vulva is narrow and shrunken. In a middle-aged animal the uterus may be in such a condition as that of a young animal whose ovaries have been removed. There are naturally many variations in size from the apparently normal to the markedly atrophied."

The above-mentioned condition was chiefly seen after eight to twelve months loss of function of the ovaries, still this inactivity atrophy may become quite noticeable, even four months after calving.

The causes in my cases were different.

More than half were due to economic conditions where the cows were overcrowded in narrow stalls and quite insufficiently fed. Some of them were used for farm work.

The remaining cases were in dairy cows forced by intensive and permanent feeding to great annual milk production.

Schnyder refers to the former condition as wasting of the ovaries and attributes it mainly to inanition, lack of nourishment, failure of

* Schweiger Archiv. f. Tierheilkunde, Nov./Dec., 1926.

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vitamins and probably hormones. It is not clear, however, whether this deficiency may not be brought about both by too great forcing of milk capacity and by poorness and too much hard work on the farm.

Biological therapy is infinitely superior to drug treatment in remedying the condition. So to-day substances derived from the endocrine glands of other animals are used to rouse the sleeping ovaries into activity. Since the endocrine glands in the system influence one another and are dependent on one another as is chiefly the case with all organs of the body, so the possibility arises that the cause of a hypofunction of the ovaries in the cow does not lie in the ovary itself, but may be due to the disturbance of function in another gland whose internal secretion is held back. This view has led to the production of a preparation from the female germ glands, the suprarenals, the thymus, the thyroids, the pineal and the hypophysis is compounded together. This preparation is sold as vethormone and is only used subcutaneously. The normal physiological function of one or several endocrine organs is often restored through glandular extracts obtained in a complicated way.

Ovary implantations have been used by Steinach with the same object and have proved successful. Adler noticed, after continued injections, for some time, of watery ovarial extracts that changes occurred in the internal genitals of virgin animals, especially of the uterus, which resembled natural œstrum, only the hyperæmia and secretion were much more intense.

Other observers (Fellner, Iscovesco and Hermann) have noticed great changes in the uterus and ovaries from the injection of corpus luteum extract, and this extract combined with placental extract.

The success attending the use of thyroid extract in struma of man and insulin in diabetes mellitus leads us to think that cases of anaphrodisia in the cow may be overcome by the injection of ovarial extracts, which are handy for the veterinary surgeon, simple and act more quickly than the ovary implantation method.

My tests on 21 cows have been conducted with extracts made from cows' ovaries with ripe follicles and quite fresh yellow bodies, and also with swine ovary extract. These extracts are thin sterile solutions of cloudy yellow colour, one centimetre of solution corresponding to one gramme of ovary. The extract was preserved in a refrigerator in a dark cellar in order to protect it from the effect of light and heat.

The injections were made in the neck after shaving a spot, rubbing with alcohol and painting with iodine. They were mostly subcutaneous, rarely intramuscular or intravenous. No bad result of the injection in the shape of local swelling or general reaction occurred.

The conclusions that Dolder comes to as regards his tests, full particulars of the individual cows being given, are shortly as follows :—

(1) The use of ovarial extract will restore partly or completely withheld function of the ovary.

(2) The success of the injection is not hampered, if instead of fresh cow's ovaries, other extract such as that from swine is used.

(3) In most cases ovary deficiency so treated leads to continued activity of the ovary, even if conception and calving occur in between.

(4) The effect of the extract is increased if it is used intramuscularly or intravenously.

(5) In the case of weak œstrum we are certainly justified in *treating* by ovarial extract, and this will bring on a full heat.

(6) The more obstinate the case the more injections necessary to bring on œstrum. Only in three cases did one injection suffice, and results were produced in five to eleven days. Two cases needed two injections and two others three injections, two further ones four injections and again two required five injections and other two needed six injections. Intervals of five to 15 days necessary to produce the desired results.

(7) In cases of cystic degeneration a condition in which a round ovary with a smooth surface may be felt, one injection leads to quick development of the cyst, hence the extract is useful as a diagnostic agent. In two animals the duration of sterility was markedly shortened, whilst with the help of the injection a successful treatment of the cysts was effected.

(8) In the presence of a persistent corpus luteum in spite of an injection of 470 c.cm. of ovarial extract no influence on the ovary was produced.

(9) In 21 animals treated by me with extract injections œstrum was produced in 19 and in three cases by the use of the injection ovarial cysts were eliminated. Conception occurred in 16 out of the 19 animals. One aborted and one was killed as a result of disease. The remaining 14 animals brought living normally developed calves into the world.

(10) These tests show that it is possible by means of ovarial extracts to overcome decided cases of anaphrodisia and the method is quite simple and time saving.

[We think that some of the research institutes might take up the question of ovarial extracts and issue preparations for the use of veterinary surgeons.—G.M.]

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Abstracts of Current Literature

Sjoberg Agnes, D.V.M., Narper, Finland.—Nematodes occurring in the Digestive Tract of Cattle.—Their Diagnosis, Clinic-Pathological Symptoms and Therapy.—*Wiener Tierarzt Monats.* XIII. October-November, 1926.

PREVENTIVE measures play a most important part in the suppression of parasitic diseases. It is important by fæces examinations to find out and isolate the parasite and treat accordingly. In contaminated stalls the dung must be removed daily and if possible the stall floor disinfected. The dung is a dangerous spreader of parasites of the intestinal tract, because the development stages of the parasites is brought about by the fæces on the meadows. If a large quantity of dung has to be dealt with it may be mixed with slaked lime or sprayed with milk of lime. After using worm remedies the voided fæces should be burnt or treated with very strong disinfectants. After overcoming a worm outbreak it is advisable to purify the stall thoroughly and mechanically and with a hot four or five per cent. caustic soda solution.

A meadow infected by cattle or sheep should not be used by ruminants the same year, but may be grazed by other animals, such as horses. The Americans have done well by ploughing the fields where outbreaks of intestinal parasites in swine have occurred. This procedure is not quite suitable for cattle pastures, in case the next year the same land must be used for cattle, because a surface sown with fresh grass, cattle cannot graze the first year. *In such cases I advise burning up the meadow early in the year*, before the green grass shoots forth. After the scorching, the grass sprouts up quickly and grows from the old roots embedded deep in the earth, which, by grazing cattle, cannot be pulled up. A meadow thus treated can probably be further used out without any danger of infection. If an infected meadow is damp and swampy it should be drained with ditches. Further it is very important to combat this disease that the animals should have a pure water supply and not drink from pools or puddled.

Schmidt-Hœnsdorf.—The Importance of the Examination of the Bone Marrow for the Diagnosis of Tuberculosis of Birds.—*Zeitschrift fur Fleisch und Milchhygiene.* June 15th, 1926, p. 285.

THE presence of tubercle bacilli in the marrow of bones has been announced several times. On 346 tuberculous fowls Eber found them in 90·1 per cent. of cases; Vosgien gives a percentage of 22·75; Van Es and Schalk 1·58 per cent. only.

The present researches were made on 31 fowls ; these 31 (93·5 per cent.) had tuberculous lesions of the marrow of the bones. The presence of caseous nodules in the marrow is diagnostic. Only one other alteration leucomyclia must be differentiated from it ; here the medullary tissue is whole or in great islets, of yellowish tint, without trace of caseation. The examination of the bone marrow can therefore make macroscopic examination certain, even in cases where the viscera appear healthy.

Bongert, Hoch and Muchlinsky.—Destroying Cattle with Chloral and the State of the Meat.—*Tierarzt. Rundschau*, 1926. No. 32, pp. 549-551.

RESEARCHES have been made in different countries to better the procedure of the slaughter of animals.

The injection into the veins of a solution of chloral at 50 per cent. brings about complete anæsthesia during which the animals can be bled. The flow of blood is perfect. Chemical examinations show that the chloral is only found again in the blood and lung. The meat contains no trace of it.

Correspondence

The Field Distemper Fund.

To the Editor of THE VETERINARY JOURNAL.

SIR,—

Less than £4,000 is now wanted to complete this Fund of £25,000, which, as you are doubtless aware, was started by the " Field " newspaper to finance the scientific investigation of the causes, prevention, or cure of distemper in dogs.

The Technical Scientific Committee, after four years' work, are now encouraged to think that they may be within sight of success. As the result of experimentation at the Research Station at Mill Hill, hounds and dogs have, under experimental conditions, been rendered immune against distemper. The problem which remains is that of producing a reliable vaccine *which can be made available for general use*, as has been done in the cases of smallpox, typhoid fever, and other diseases.

The Field Distemper Council, of which I am President, feel that all dog-lovers would wish to be associated with this work before its com-

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pletion. It is to be remembered that every owner of a dog, who may not yet have supported us, will be able to share in the benefit of the discovery in common with those who have already subscribed.

On behalf of the Council, therefore, I appeal for generous donations to complete the Fund this year. Cheques should be sent to the Organising Secretary, Field Distemper Fund, Windsor House, Bream's Buildings, London, E.C.4.

Faithfully yours,

3, Grosvenor Square, W.1. PORTLAND.
November 17th, 1927.

Review

Topographical Anatomy of the Dog. By O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.; Principal, Royal (Dick) Veterinary College, Edinburgh; Lecturer in Comparative Anatomy, University of Edinburgh. Second edition. Published by Oliver & Boyd, Edinburgh. Price 24s. net.

DR. BRADLEY has revised and amplified his standard work, "Notes on the Dissection of the Dog," and to fit it more to modern needs he has aptly renamed it "The Topographical Anatomy of the Dog."

In its present form the book will be of great use to all concerned with the dog, both in health and disease.

To the anatomist it admirably fills a long-felt want. With the increasing necessity of the study of canine anatomy, it will be of great use equally to students and teachers.

To the clinician, and particularly the surgeon, it is invaluable. The science of veterinary surgery has advanced largely because of the ever-increasing importance of the dog, and up to the present there has been no anatomical treatise in the English language devoted entirely to our canine patients to which the surgeon could turn.

The book is one that is easily readable and holds one's interest. The terminology is a judicious mixture of the old and new, and in this we must compliment Dr. Bradley.

It contains many excellent original plates and diagrams done by an eminent anatomical artist, Mr. James T. Murray. The book is one that we can confidently recommend to the Veterinary Profession.

Royal Veterinary College.

Presentations to Professor Sir John McFadyean and Dr. L. Sheather.

ON Monday, December 12th, at 3.0 p.m., a very interesting ceremony took place in the large lecture theatre of the Royal Veterinary College, when the late Principal, Professor Sir John McFadyean, and Dr. Leslie

Sheather were the recipients of testimonials from the Professional Staff, the Students, and the Employees. The token of goodwill selected for Sir John took the form of a " Grandmother's " Clock of very beautiful design and with exquisitely sweet chimes, whilst Dr. Sheather was made the recipient of a Gold Cigarette Case.

Both were suitably inscribed and the former also bore the arms of the College.

In addition to the members of the College staff the platform was occupied by Sir John Moore, K.C.M.G., C.B., F.R.C.V.S., who represented the Governors, and Professor Wilberforce, D.Sc., the Director of the Veterinary Board of Studies of the University of Liverpool, who happened to be visiting the College on that afternoon. The Students, of whom about 100 were present, were officially represented by Capt. Tomlin, and the recipients of the Testimonials received a very enthusiastic ovation. The Veterinary Press were represented by the *Veterinary Record* and THE VETERINARY JOURNAL.

Professor McQueen, as Chairman of the Committee, opened the proceedings with a few well-chosen remarks, which were followed by a speech of welcome by Capt. Tomlin.

This gentleman expressed in a very hearty manner the great affection in which Sir John had always been held by those who have passed through his hands and wished him, on behalf of everybody, a long period of good health in his retirement.

Sir John McFadyean and Dr. Sheather were each called upon to reply, and a round of cheers, following upon the refrain of " For they are jolly good fellows," called for by the newly-appointed Principal, Sir John's successor, Major F. Hobday, C.M.G., F.R.C.V.S., brought a most interesting and pleasant episode to a conclusion.

Presentation to Professor Edward Simpson Shave, F.R.C.V.S, M.R.C.S., L.R.C.P.

AT the conclusion of the Anatomy Examination of the Royal College of Veterinary Surgeons, held in London at the Royal Veterinary College on December 20th last, an interesting little scene was enacted in which Professor Shave was presented by the Principal (Major Frederick Hobday, C.M.G., F.R.C.V.S.) as Patron, with the Honorary Associateship of the College Medical Association in the shape of a gold lettered vellum certificate upon which the name of the recipient was suitably inscribed. The Principal was supported by Professor McCunn (the Secretary) and other members of the College staff, together with a number of the Examiners and others, and in a felicitous speech drew attention amongst other things to the many years which Professor Shave had belonged to the Association ; he having followed in office the original Founder, the late Professor John Henry Steel, F.R.C.V.S., F.Z.S. The awarding of these particular certificates has been of very rare occurrence, and Professor Shave is to be congratulated as the recipient of a token of so much affection from his old students and associates ; a token not only of goodwill, but of the great esteem in which his name is still held by every one of the numerous graduates who have passed through his hands.

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Obituary

PROFESSOR GUSTAV LORENZ has died at the age of 82. He was a great research worker and his observations on serum therapy were among the earliest published in this branch of science. His " Simultaneous Inoculation " against swine erysipelas has been well known and practised with success for many years. Science has also benefited in other cases from the knowledge obtained through Lorenz' work.

Notices

The Olympia Circus.

THE Eighth Olympia Circus organised by Capt. Bertram W. Mills was opened by the Earl of Lonsdale on December 21st, and the season will last until January 24th, with performances each day at 2.30 and 7.30.

Capt. Mills has spent the past ten months touring the Continent and America in search of arena talent new to England and, with one exception, each of the twenty-two acts is a production fresh to London. Considerably over a hundred horses will figure in the ring at various times and some of the world's most famous stables will be represented. Of the performing animals there is a sea-lion which actually plays tunes on the bells, and there are four dancing and acting elephants.

The thrills of the Circus include Captain Wall's underwater wrestle with giant crocodiles, Mdlle. de Marlo, the human top, who spins from the roof at lighting speed, a mounted horse which parachutes into the arena amid a firework display, and Leinhert who is shot 80 feet into the air from a 35 ft. cannon.

The animals are worth seeing if only from the veterinary point of view of affording an opportunity for the study of animal psychology and cleverness.

Publishers' Notices

All communications should be addressed to 7 & 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: " Baillière, Rand. London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Copy of advertisements should be in the hands of the publishers—Baillière, Tindall and Cox—not later than the 25th of the month, or if proof is required, not later than 23rd.

Binding Cases for Volume 82 and any other previous volumes can be obtained from the publishers. Price 2s. 9d. post free.

Annual Subscription, 21s. ($5.00 U.S.A. currency) post free.

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